



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/719,014	11/24/2003	Nikolai N. Issaev	08935-291001 / M-5027	9164
26161	7590	01/08/2007	EXAMINER	
FISH & RICHARDSON PC P.O. BOX 1022 MINNEAPOLIS, MN 55440-1022			TALBOT, BRIAN K	
		ART UNIT	PAPER NUMBER	
		1762		

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/08/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/719,014	ISSAEV ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Brian K. Talbot	1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 10 February 2006.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-57 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-57 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____ .                                    |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>6/24/04</u> .   | 6) <input type="checkbox"/> Other: _____ .                        |

Art Unit: 1762

1. Claims 1-57 remain in the application.

***Specification***

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claims are directed toward a method of making a cathode for a battery by coating.

3. The abstract of the disclosure is objected to because the abstract fails to recite a concise statement of the technical disclosure. The abstract fails to recite any coating steps. Correction is required. See MPEP § 608.01(b).

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 21,22,25,35,36 and 39 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With respect to claims 21,35 and 51, the term “pulling” is confusing. Clarification is requested.

With respect to claims 22 and 36, the term “leveling” is confusing. Clarification is requested.

With respect to claims 25 and 39, the claims are not further limiting as the process of “calendering” includes passing a coated substrate through a gap to squeeze/press the coating. If there were no gap then “calendaring” would not be possible.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-8,23-28,41-48 and 57 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Takeuchi et al. (5,543,249).

Takeuchi et al. (5,543,249) teaches an aqueous blended electrode material for use in electrochemical cells and manufacture. Takeuchi et al. (5,543,249) teaches forming cathode powder mixture, spreading onto an expanded metal grid and calendaring to form the cathode laminate. The laminate is then heated and cut to size and rolled to final thickness (Fig. 2 and col. 3, line 25 – col. 4, line 5). The cathode active material includes, fluorinated carbon, manganese dioxide, iron disulfide, etc (col. 2, lines 40-58). A polymer binder is added to the cathode active material as well as the carbon material to form the cathode active material. The expanded metal

screen or grid is preferably aluminum (col. 3, line 45). Takeuchi et al. (5,543,249) teaches that slurry application is also known (col. 1, line 25-55).

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 21,22 and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeuchi et al. (5,543,249) in combination with Michel et al. (2004/0264110).

Takeuchi et al. (5,543,249) fails to teach a current collector that includes a pulled grid or leveled grid.

Michel et al. (2004/0264110) teaches electrodes and production thereof whereby a aluminum current collector is stretched prior to application of a cathode active material ([0013]-[0026] and [0036]).

Therefore it would have been obvious to have modified Takeuchi et al. (5,543,249) battery to include a current collector that is pulled or leveled prior to coating with the cathode active material as evidenced by Michel et al. (2004/0264110) with the expectation of achieving the benefits associated therewith, i.e. increased surface area.

With respect to the leveling, it is the Examiner's position that when the collector is stretched it also is leveled.

Claims 9-20,29-34,37-40 and 49-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeuchi et al. (5,543,249) in view of Tischer et al ("Candidate materials for the sulfur electrode current collector", Corrosion Science, Vol. 26, No. 5, pp. 377-388, 1986).

Features described above concerning the teachings of Takeuchi et al. (5,543,249) are incorporated here.

Takeuchi et al. (5,543,249) fails to teach a current collector that includes an aluminum alloy that is a 6000 series aluminum alloy including 0.04-0.4% by weight of chromium, 0.01-6.8% by weight of copper, 0.1-7% by weight of magnesium, 0.15% or less by weight of manganese, and 0.4-0.8% by weight of silicon; an aluminum alloy including 0.15-0.4% by weight of copper, 0.7% or less by weight of iron, 0.8-1.2% by weight of magnesium, 0.1% or less by weight of titanium, and 0.25% or less by weight of zinc; a current collector that has a yield strength of at least 2.0 lb/in; a current collector that has a yield strength of at least 5 lb/in; a current collector that has a tensile strength of at least 5 lb/in; a current collector that has a tensile strength of at least 7 lb/in; a current collector that has a yield strength of at least 2.0 lb/in and a tensile strength of at least 5 lb/in; a current collector that has a resistivity of less than 10 mΩ/cm; and a current collector including a 6061 aluminum alloy.

Tischer et al ("Candidate materials for the sulfur electrode current collector", Corrosion Science, Vol. 26, No. 5, pp. 377-388, 1986) discloses a positive current collector for a battery comprising a 6061 aluminum alloy (See Introduction and Table 1). Examiner's note: A 6061

aluminum alloy has the following properties: tensile strength of 18100 psi, yield strength of 7980 psi, and a resistivity of 3.7e-006 ohm-cm.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Takeuchi et al. (5,543,249) battery to include a current collector that includes an aluminum alloy that is a 6000 series aluminum alloy including 0.04-0.4% by weight of chromium, 0.01-6.8% by weight of copper, 0.1-7% by weight of magnesium, 0.15% or less by weight of manganese, and 0.4-0.8% by weight of silicon; an aluminum alloy including 0.15-0.4% by weight of copper, 0.7% or less by weight of iron, 0.8-1.2% by weight of magnesium, 0.1% or less by weight of titanium, and 0.25% or less by weight of zinc; a current collector that has a yield strength of at least 2.0 lb/in; a current collector that has a yield strength of at least 5 lb/in; a current collector that has a tensile strength of at least 5 lb/in; a current collector that has a tensile strength of at least 7 lb/in; a current collector that has a yield strength of at least 2.0 lb/in and a tensile strength of at least 5 lb/in; a current collector that has a resistivity of less than 10 mΩ/cm; and a current collector including a 6061 aluminum alloy as evidenced by Tischer et al (“Candidate materials for the sulfur electrode current collector”, Corrosion Science, Vol. 26, No. 5, pp. 377-388, 1986) in order to utilize an aluminum alloy that is highly corrosion resistant even at high temperatures.

Claims 35 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeuchi et al. (5,543,249) in view of Tischer et al (“Candidate materials for the sulfur electrode current collector”, Corrosion Science, Vol. 26, No. 5, pp. 377-388, 1986) further in combination with .

Features described above concerning the teachings of Takeuchi et al. (5,543,249) are incorporated here.

Michel et al. (2004/0264110) teaches electrodes and production thereof whereby a aluminum current collector is stretched prior to application of a cathode active material ([0013]-[0026] and [0036]).

Therefore it would have been obvious to have modified Takeuchi et al. (5,543,249) in view of Tischer et al ("Candidate materials for the sulfur electrode current collector", Corrosion Science, Vol. 26, No. 5, pp. 377-388, 1986) battery to include a current collector that is pulled or leveled prior to coating with the cathode active material as evidenced by Michel et al. (2004/0264110) with the expectation of achieving the benefits associated therewith, i.e. increased surface area.

With respect to the leveling, it is the Examiner's position that when the collector is stretched it also is leveled.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian K. Talbot whose telephone number is (571) 272-1428. The examiner can normally be reached on Monday-Friday 6AM-3PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy H. Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1762

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

 113106  
Brian K Talbot  
Primary Examiner  
Art Unit 1762

BKT